CLAIMS

1.   A method of predicting whether a given composition will form a saline soluble vitreous material, the method comprising the steps of:-

EITHER

a)   assuming the composition to be a mixture of the compounds that would be present at equilibrium (on the basis of knowledge, informed belief or reasonable assumption);

b)   calculating the sum of the free energies of hydration of each of the compounds assumed to be present;

c)   if the sum of the free energies of hydration is more negative than -10 kcal/100grams (-418.4kJ/kg) of composition, assuming the composition to be soluble in saline solution;

OR

a") calculating the percentage of non-bridging oxygens present in relation to the total oxygen present and, if the percentage is greater than 30% assuming the composition to be soluble in saline solution;

2.   A method as claimed in claim 1 which further comprises in combination with steps a)-c) and/or a"):-

d)   calculating the ratio of glass modifier to network former present;

e)   if the ratio is less than a critical value (for SiO_2 based compositions, 1) assuming that the composition will form a vitreous material.

3.   A saline soluble vitreous inorganic fibre selected and used in the knowledge that it has a composition meeting the criteria that:-

a)   the calculated sum of the free energies of hydration of the compounds that would or could be present at equilibrium (on the basis of knowledge, informed belief or reasonable assumption) is more negative than -10 kcal/100 grams (-418.4kJ/kg) of composition;

and/or

b)   the percentage of non-bridging oxygens present in relation to the total oxygen present is greater than 30%.

4.   A saline soluble vitreous inorganic fibre as claimed in claim 3 selected and used in the knowledge that it has a composition meeting the criterion that the ratio of glass modifiers to network formers is less than a critical value (for SiO_2 based compositions, 1).

5.   Use of a saline soluble vitreous inorganic fibre in the knowledge that it has a composition meeting the criteria that:-

a)   the calculated sum of the free energies of hydration of the compounds that would or could be present at equilibrium on the basis of knowledge, informed belief or reasonable assumption is more negative than -10 kcal/100grams (-418.4kJ/kg) of composition;

and/or

b)   the calculated percentage of non-bridging oxygens in relation to the total oxygen content is more than 30%.

6.   Use as claimed in claim 5 of a saline soluble vitreous inorganic fibre in the knowledge that it has a composition meeting the criterion that the ratio of glass modifiers to network formers is less than a critical value (for SiO_2 based compositions, 1).

7.   Use as saline soluble fibres having a shrinkage of less than 3.5% when exposed to 1000°C for 24 hours and/or 800°C for 24 hours, of vitreous fibres having a composition comprising (in weight %):-

SiO_2	>58%	- (for MgO =< 10%) and
SiO_2	>58% + 0.5(%MgO -10)	- (for MgO >= 10%)
CaO	0% - 42%	
MgO	0% - 31.33%	
Al_2O_3	0% - <3.97%	

and being essentially free of fluxing components such as alkali metals and boron oxide.

8.   Use as claimed in claim 7 of saline soluble fibres having a shrinkage of less than 3.5% when exposed to 1000°C and/or 800°C for 24 hours, of vitreous fibres in which the amount of SiO_2 is <70%.

9.   Use as claimed in any of claims 7-8 of saline soluble fibres having a shrinkage of less than 3.5% when exposed to 1000°C and/or 800°C for 24 hours, the fibres crystallising as diopside and having the composition consisting essentially of:-

Component	Composition A Weight percent
SiO_2	59-64
Al_2O_3	0-3.5
CaO	19-23
MgO	14-17

10.   Use as claimed in any of claims 7-8 of saline soluble fibres having a shrinkage of less than 3.5% when exposed to 1000°C and/or 800°C for 24 hours, the fibres crystallising as wollastonite and/or pseudowollastonite and having the composition consisting essentially of:-

Component	Composition B Weight percent
SiO_2	60-67
Al_2O_3	0-3.5
CaO	26-35
MgO	4-6

11.   Use as a saline soluble fibre as claimed in any of claims 5-10 and in which, owing to the increase in molar volume on crystallisation, the linear shrinkage at the maximum service temperature is less than 3.5%.

12.   A method for the manufacture of refractory oxide fibres containing calcium and silicon by the formation of an oxide melt containing calcium and silicon characterised in that all or part of the calcium and all or part of silicon is provided by a calcium silicate.

13.   A method as claimed in claim 13 in which the calcium silicate is wollastonite.